OK

Total Score

Name.....

School .....

Roll No .....

Republic of Somaliland

Somaliland National Examination Board

Form Four

MATHEMATICS
PAPER ONE

2021 - 2022

TIME 2 HOURS

Plus 10 minutes for reading through the paper

INSTRUCTIONS TO CANDIDATES

This paper consists of 12 printed pages.
Count them now. Inform the invigilator if there are any pages missing.

The exam consists of 2 parts:

PART 1:	20 Multiple Choice Questions	40 Marks
PART 2:	10 Structured Questions	60 Marks

TOTAL 100 Marks

- Answer ALL questions in Part 1 and 2.
- Extra papers and Mobiles are NOT Allowed.

Use this page for rough work. It will NOT be marked.

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PART 1: Multiple choice Questions. (40 marks).

Circle the correct answer, each question carries 2 marks.

1. Convert $\frac{4}{3}\pi$ to degrees :

   A. 120^0

   B. 60^0

   C. 240^0

   D. 300^0

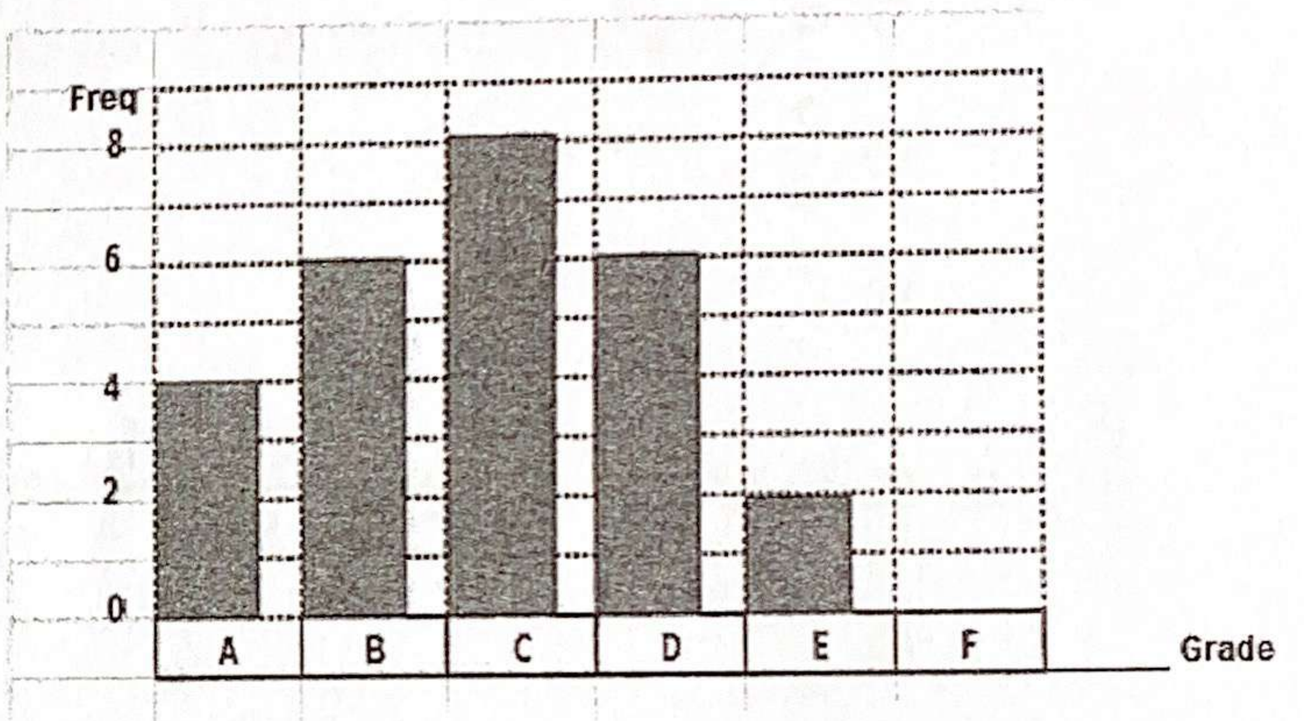
2. The marks obtained by a class of 26 students in a maths test are shown below. What is the mode?

   A. B

   B. F

   C. A

   D. C



3. The derivative of sinx is :

   A. cos x

   B. – cosx

   C. secx

   D. tanx

4. Evaluate ${}_6C_4$:

   A. 120

   B. 60

   C. 30

   D. 15

5. What is the conjugate of - 3i + 4 ?

   A. 3i – 4

   B. -3i -4

   C. 4 +3i

   D. 4-3i

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6. If the equation of the curve $y = 4x - \frac{x^3}{3}$, calculate the gradient of the curve at x = 3:

A) -5

B) 5

C) 9

D) -9

7. An ordinary die is thrown once. What is the probability of getting an even number ?

A) $\frac{1}{6}$

B) $\frac{1}{2}$

C) $\frac{2}{3}$

D) $\frac{1}{3}$

8. Evaluate the $\lim_{x \to \infty} \frac{4x^2 - 1}{5x^2}$

A) $\frac{5}{4}$

B) $-\frac{4}{5}$

C) $\frac{3}{5}$

D) $\frac{4}{5}$

9. If $2\sin^2 x - \sin x = 0$, solve x for the range $0^0 < x < 180^0$:

A) $0^0, 30^0$

B) $30^0, 150^0$

C) $0^0, 180^0$

D) $180^0, 360^0$

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10. Integrate $\int(3x^2 + 4x - 5)\,dx$

A) $x^3 + 2x^2 - 5x + c$

B) $x^3 + 2x^2 + 5x + c$

C) $x^3 - 2x^2 + 5x + c$

D) $x^3 - 2x^2 - 5x + c$

11. Which of the following expressions is the same as cos2A?

A) $Cos^2 + \sin^2 A$

B) 1

C) $2\cos^2 A + 1$

D) $2\cos^2 A - 1$

12. Compute the interquartile range for the data set: 6, 12, 13, 9, 3, 10 and 4

A) 6

B) 4

C) 8

D) 16

13. Find the value of x and y , that makes the equation $5x + 3yi = 10 - 9i$ true .

A) (2, -3)

B) (-2, 3)

C) (-3, 2)

D) (-2, -3)

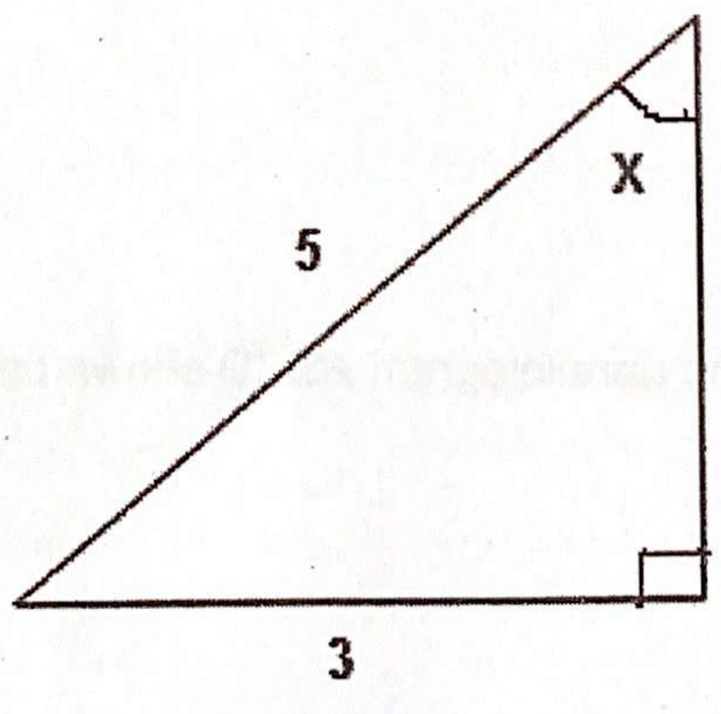
14. Given that $\sin A = \frac{3}{5}$ and A is an acute angle, calculate sec A?

A) $\frac{3}{4}$

B) $\frac{4}{5}$

C) $\frac{5}{3}$

D) $\frac{5}{4}$



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15. The ages of 10 pupils on a primary class is given below :

12, 8, 10, 8, 9, 10, 11, 9, 8, 9. What is the mean age of the pupils?

A) 11

B) 10

C) 12

D) 8

16. Change 540^0 to π radians.

A) 3π

B) 2π

C) $\frac{3}{2}\pi$

D) $\frac{3}{4}\pi$

17. If 8 people can clean the school in 6 hours, how many people are needed to clean the school in 4 hours ?

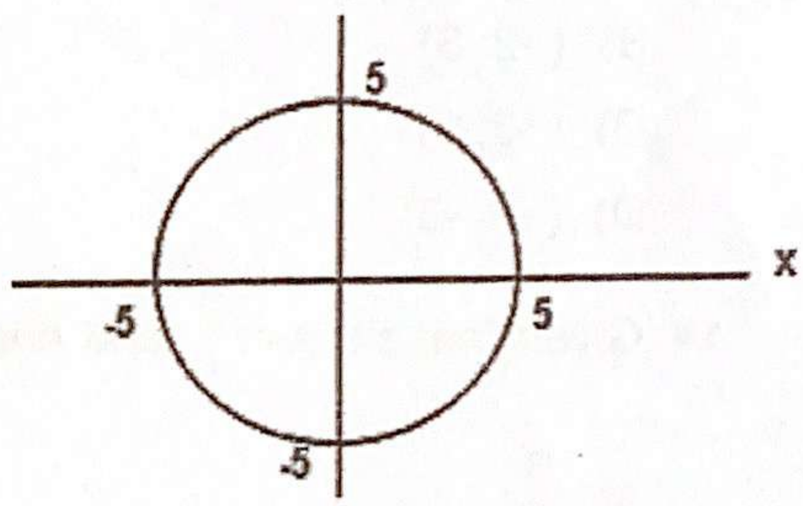
A) 5

B) 3

C) 12

D) 8

18. Find the equation of the circle shown below .



A) $x^2 + y^2 = 15$

B) $x^2 + y^2 = 25$

C) $x^2 + y^2 = 5$

D) $x^2 + y^2 = 125$

19. Evaluate $\log_2 \frac{1}{8}$

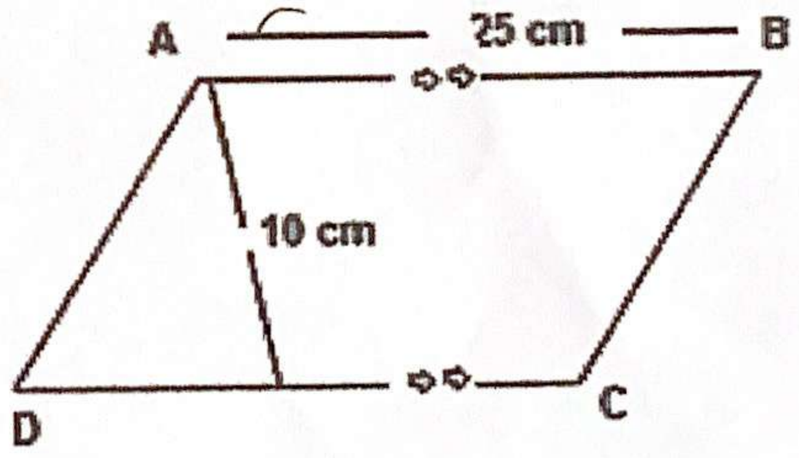
A) -2

B) +2

C) +3

D) -3

20. Calculate the area of the parallelogram ABCD shown below. Given that AB =CD



A) 205 cm^2

B) 250 cm^2

C) 200 cm^2

D) 125 cm^2

PART 2: **Structured question.** **(60 Marks)**

Do all the following question in the spaces provided

1. Evaluate the following

a) $\lim_{x \to 2} -3x + 9$ (2 marks)

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.....

b) $\lim_{x \to -5} \frac{x^2 - 25}{x + 5}$ (2 marks)

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.....

c) $\int_1^3 (3x^2 - 4x + 5)\, dx$ (2 marks)

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2. Convert each of the following radians to degrees.

a) $\frac{3}{4}\pi$ (2 marks)

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b) $\frac{5}{3}\pi$ (2 marks)

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c) $\frac{\pi}{6}$ (2 marks)

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3. A box contains 3 red , 2 blue and 5 white marbles. A marble is drawn at random from the box. What is the probability of getting :

a) A red marble (1 marks)

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b) A blue marble (1 marks)

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c) A red or blue marble (2 marks)

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.....

d) Neither blue nor red (2 marks)

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4. Integrate each of the following

a) $\int 2x \ dx$ (2 marks)

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b) $\int \ sin\, 4x \ dx$ (2 marks)

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c) $\int -\frac{3}{x^2} \ dx$

(2 marks)

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5. Simplify each of the following

a) $\sqrt{109}$

(2 marks)

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b) (-8 +5 i) + (6 – 3i)

(2 marks)

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.....

c.) (3 + 2i) (3 -2i)

(2 marks)

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6. The table below shows the marks obtained by 30 students in a class.

Score	Mid-mark (x)	Freq f	fx
0 – 9	4.5	4	18
10-19		6	
20-29		10	
30-39	34.5	8	276
40-49		2	
Total		∑f= 30	∑fx =

a) Complete the table

(3 marks)

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.....

b) Calculate the estimate mean mark

(3 marks)

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7. Find the derivative of the following

a) $y = x^3 + x^2 - 1$ (2 marks)

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b) $y = x^2 (x^3 - 1)$ (2 marks)

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c) $y = \tan x$ (2 marks)

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8. Prove the following identities

a) $\frac{\sin 2x}{1-cos2\,x} = \cot x$ (3 marks)

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b) $\sec^4 \emptyset - \sec^2 \emptyset = \tan^4 \emptyset + \tan^2 \emptyset$ (3 marks)

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9. If $f(x) = 3x + 1$ and $g(x) = 2x - 1$. Find

a) $f(2)$ (1 marks)

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b) $g(-3)$ (1 marks)

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c) $f(2) - f(-3)$ (2 marks)

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d) $g^{-1}(x)$ (2 marks)

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10. a) Find the sale price of a car that has a cost price of $ 2000 and a discount rate of 15 %? (3 marks)

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b.) Find the simple interest earned with sh 4000000 for 2 year at 5% per annum? (3 marks)

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End

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